

WHAT IS CLAIMED IS:

- 1           1. A memory characterization method, comprising
- 2           the steps:
- 3                 generating a plurality of tiles forming a
- 4           memory instance, said plurality of tiles including at
- 5           least one of a sub-plurality of row decoder tiles, a sub-
- 6           plurality of input/output (I/O) block tiles, a sub-
- 7           plurality of bitcell array tiles and at least one control
- 8           block tile;
- 9                 providing input and output pins for each tile
- 10          with respect to a plurality of global signals spanning
- 11          said memory instance in at least one of a horizontal and
- 12          a vertical direction;
- 13                 obtaining a parametric dataset for each of said
- 14          plurality of tiles; and
- 15                 creating a hierarchically-stitched parametric
- 16          netlist for said memory instance by coupling said
- 17          parametric datasets using said input and output pins of
- 18          said plurality of tiles with respect to said global
- 19          signals.

1           2.    The memory characterization method as set forth  
2    in claim 1, wherein said tiles are generated based on a  
3    minimum area required to encompass an optimal number of  
4    memory strap points associated with at least a portion of  
5    said global signals.

1           3.    The memory characterization method as set forth  
2    in claim 1, wherein said memory instance comprises a  
3    post-layout schema, and further wherein said step of  
4    obtaining a parametric dataset for each of said plurality  
5    of tiles comprises extracting an RC netlist from a select  
6    portion of said post-layout schema corresponding to a  
7    particular tile.

1           4.    The memory characterization method as set forth  
2    in claim 1, wherein said memory instance comprises a pre-  
3    layout schema, and further wherein said step of obtaining  
4    a parametric dataset for each of said plurality of tiles  
5    comprises estimating RC parametric data corresponding to  
6    a particular tile based on its wire-delay model.

1           5.    The memory characterization method as set forth  
2    in claim 4, wherein said wire-delay model is based on  
3    said particular tile's design size parameter.

1           6.    The memory characterization method as set forth  
2    in claim 3, wherein said wire-delay model is based on a  
3    connection number parameter corresponding to said  
4    particular tile.

1           7.    The memory characterization method as set forth  
2    in claim 1, wherein said plurality of tiles are generated  
3    from a memory instance comprising a read-only memory  
4    (ROM) circuit.

1           8.    The memory characterization method as set forth  
2    in claim 1, wherein plurality of tiles are generated from  
3    a memory instance comprising a static random access  
4    memory (SRAM) circuit.

1           9.    The memory characterization method as set forth  
2    in claim 1, wherein plurality of tiles are generated from  
3    a memory instance comprising a dynamic random access  
4    memory (DRAM) circuit.

1           10.   The memory characterization method as set forth  
2    in claim 1, wherein said plurality of tiles are generated  
3    from a memory instance comprising an electrically  
4    programmable ROM (EPROM) circuit.

1           11. The memory characterization method as set forth  
2           in claim 1, wherein said plurality of tiles are generated  
3           from a memory instance comprising a flash memory circuit.

4           12. The memory characterization method as set forth  
5           in claim 1, wherein said plurality of tiles are generated  
6           from a memory instance comprising a compilable memory  
7           circuit.

1           13. The memory characterization method as set forth  
2           in claim 1, wherein said plurality of tiles are generated  
3           from a memory instance comprising an embedded memory  
4           circuit.

1           14. The memory characterization method as set forth  
2           in claim 1, wherein said plurality of tiles are generated  
3           from a memory instance comprising a stand-alone memory  
4           circuit.

1           15. The memory characterization method as set forth  
2           in claim 1, wherein said global signals comprise a  
3           plurality of pre-decoder signals emanating from said at  
4           least one control block tile, said pre-decoder signals  
5           being operable to couple said sub-plurality of row  
6           decoder tiles in a head-to-tail fashion along said  
7           vertical direction.

1           16. The memory characterization method as set forth  
2           in claim 1, wherein said global signals comprise a  
3           plurality of wordline signals emanating from said sub-  
4           plurality of row decoder tiles.

1           17. The memory characterization method as set forth  
2           in claim 16, wherein each row decoder tile is coupled to  
3           a corresponding portion of said plurality of wordline  
4           signals, said corresponding portion being operable to  
5           couple a select row of said sub-plurality of bitcell  
6           array tiles in a head-to-tail fashion along said  
7           horizontal direction.

1           18. The memory characterization method as set forth  
2           in claim 1, wherein said global signals comprise a  
3           plurality of control signals emanating from said at least  
4           one control block tile, said control signals being  
5           operable to couple said sub-plurality of I/O block tiles  
6           in a head-to-tail fashion along said horizontal  
7           direction.

1           19. The memory characterization method as set forth  
2           in claim 1, wherein said global signals comprise a  
3           plurality of bitline signals emanating from said sub-  
4           plurality of I/O block tiles.

1           20. The memory characterization method as set forth  
2           in claim 19, wherein each I/O block tile is coupled to a  
3           corresponding portion of said plurality of bitline  
4           signals, said corresponding portion being operable to  
5           couple a select column of said sub-plurality of bitcell  
6           array tiles in a head-to-tail fashion along said vertical  
7           direction.

1           21. The memory characterization method as set forth  
2           in claim 1, wherein said global signals comprise a  
3           plurality of power lines coupling said sub-plurality of  
4           I/O block tiles with said sub-plurality of bitcell array  
5           tiles in said vertical direction.

1           22. A memory characterization system, comprising:  
2           means for generating a plurality of tiles  
3 forming a memory instance, said plurality of tiles  
4 including at least one of a sub-plurality of row decoder  
5 tiles, a sub-plurality of input/output (I/O) block tiles,  
6 a sub-plurality of bitcell array tiles and at least one  
7 control block tile;

8           means for identifying input and output pins for  
9 each tile with respect to a plurality of global signals  
10 spanning said memory instance in at least one of a  
11 horizontal and a vertical direction;

12           means for obtaining a parametric dataset for  
13 each of said plurality of tiles; and

14           means for creating a hierarchically-stitched  
15 parametric netlist for said memory instance by coupling  
16 said parametric datasets using said input and output pins  
17 of said plurality of tiles with respect to said global  
18 signals.

1           23. The memory characterization system as set forth  
2           in claim 22, wherein said means for obtaining a  
3           parametric dataset comprises one of a post-layout  
4           extractor tool and a pre-layout parametric wire-delay  
5           estimator.

1           24. The memory characterization system as set forth  
2           in claim 22, wherein said memory instance comprises one  
3           of a DRAM circuit, an SRAM circuit, a ROM circuit, an  
4           EPROM circuit and a flash memory circuit.

1           25. The memory characterization system as set forth  
2           in claim 22, wherein said memory instance comprises an  
3           embedded memory circuit.

1           26. The memory characterization system as set forth  
2           in claim 22, wherein said memory instance comprises a  
3           compilable memory circuit.

1           27. The memory characterization system as set forth  
2           in claim 22, wherein said memory instance comprises a  
3           stand-alone memory circuit.



1           28. The memory characterization system as set forth  
2       in claim 22, wherein said global signals comprise a  
3       plurality of pre-decoder signals emanating from said at  
4       least one control block tile, said pre-decoder signals  
5       being operable to couple said sub-plurality of row  
6       decoder tiles in a head-to-tail fashion along said  
7       vertical direction.

1           29. The memory characterization system as set forth  
2       in claim 22, wherein said global signals comprise a  
3       plurality of wordline signals emanating from said sub-  
4       plurality of row decoder tiles.

1           30. The memory characterization system as set forth  
2       in claim 29, wherein each row decoder tile is coupled to  
3       a corresponding portion of said plurality of wordline  
4       signals, said corresponding portion being operable to  
5       couple a select row of said sub-plurality of bitcell  
6       array tiles in a head-to-tail fashion along said  
7       horizontal direction.

1           31. The memory characterization system as set forth  
2 in claim 22, wherein said global signals comprise a  
3 plurality of control signals emanating from said at least  
4 one control block tile, said control signals being  
5 operable to couple said sub-plurality of I/O block tiles  
6 in a head-to-tail fashion along said horizontal  
7 direction.

1           32. The memory characterization system as set forth  
2 in claim 22, wherein said global signals comprise a  
3 plurality of bitline signals emanating from said sub-  
4 plurality of I/O block tiles.

1           33. The memory characterization system as set forth  
2 in claim 32, wherein each I/O block tile is coupled to a  
3 corresponding portion of said plurality of bitline  
4 signals, said corresponding portion being operable to  
5 couple a select column of said sub-plurality of bitcell  
6 array tiles in a head-to-tail fashion along said vertical  
7 direction.

1           34. The memory characterization system as set forth  
2 in claim 22, wherein said global signals comprise a  
3 plurality of power lines coupling said sub-plurality of  
4 I/O block tiles with said sub-plurality of bitcell array  
5 tiles in said vertical direction.

1           35. A computer-accessible medium operable in  
2 connection with a processor environment, said computer-  
3 accessible medium carrying a sequence of instructions  
4 which, when executed in said processor environment, cause  
5 the following steps to be performed:

6           generating a plurality of repeatable tiles for  
7 a memory instance, said plurality of tiles including at  
8 least one of a sub-plurality of row decoder tiles, a sub-  
9 plurality of input/output (I/O) block tiles, a sub-  
10 plurality of bitcell array tiles and at least one control  
11 block tile;

12           identifying input and output pins for each tile  
13 with respect to a plurality of global signals spanning  
14 said memory instance in at least one of a horizontal and  
15 a vertical direction;

16           obtaining a parametric dataset for each of said  
17 plurality of tiles; and

18           creating a hierarchically-stitched parametric  
19 netlist for said memory instance by coupling said  
20 parametric datasets using said input and output pins of  
21 plurality of tiles with respect to said global signals.

1           36. The computer-accessible medium as set forth in  
2 claim 35, wherein said step of obtaining a parametric  
3 dataset for each of said plurality of tiles comprises  
4 extracting an RC netlist from a select portion of a post-  
5 layout schema corresponding to a particular tile.

1           37. The computer-accessible medium as set forth in  
2 claim 35, wherein said step of obtaining a parametric  
3 dataset for each of said plurality of tiles comprises  
4 estimating RC parametric data corresponding to a  
5 particular tile based on its pre-layout wire-delay model.

1           38. The computer-accessible medium as set forth in  
2 claim 35, wherein said memory instance comprises one of  
3 a DRAM circuit, an SRAM circuit, a ROM circuit, an EPROM  
4 circuit and a flash memory circuit.

1           39. The computer-accessible medium as set forth in  
2 claim 35, wherein said memory instance comprises an  
3 embedded memory circuit.

1           40. The computer-accessible medium as set forth in  
2 claim 35, wherein said memory instance comprises a  
3 compilable memory circuit.

1           41. The computer-accessible medium as set forth in  
2 claim 35, wherein said memory instance comprises a stand-  
3 alone circuit.

1           42. The computer-accessible medium as set forth in  
2 claim 35, wherein said global signals comprise a  
3 plurality of pre-decoder signals emanating from said at  
4 least one control block tile, said pre-decoder signals  
5 being operable to couple said sub-plurality of row  
6 decoder tiles in a head-to-tail fashion along said  
7 vertical direction.

1           43. The computer-accessible medium as set forth in  
2 claim 35, wherein said global signals comprise a  
3 plurality of wordline signals emanating from said sub-  
4 plurality of row decoder tiles.

1           44. The computer-accessible medium as set forth in  
2 claim 43, wherein each row decoder tile is coupled to a  
3 corresponding portion of said plurality of wordline  
4 signals, said corresponding portion being operable to  
5 couple a select row of said sub-plurality of bitcell  
6 array tiles in a head-to-tail fashion along said  
7 horizontal direction.

1           45. The computer-accessible medium as set forth in  
2 claim 35, wherein said global signals comprise a  
3 plurality of control signals emanating from said at least  
4 one control block tile, said control signals being  
5 operable to couple said sub-plurality of I/O block tiles  
6 in a head-to-tail fashion along said horizontal  
7 direction.

1           46. The computer-accessible medium as set forth in  
2 claim 35, wherein said global signals comprise a  
3 plurality of bitline signals emanating from said sub-  
4 plurality of I/O block tiles.

1           47. The computer-accessible medium as set forth in  
2 claim 46, wherein each I/O block tile is coupled to a  
3 corresponding portion of said plurality of bitline  
4 signals, said corresponding portion being operable to  
5 couple a select column of said sub-plurality of bitcell  
6 array tiles in a head-to-tail fashion along said vertical  
7 direction.

1           48. The computer-accessible medium as set forth in  
2 claim 35, wherein said global signals comprise a  
3 plurality of power lines coupling said sub-plurality of  
4 I/O block tiles with said sub-plurality of bitcell array  
5 tiles in said vertical direction.

1           49. The computer-accessible medium as set forth in  
2 claim 35, wherein said tiles are generated based on a  
3 minimum area required to encompass an optimal number of  
4 memory strap points associated with at least a portion of  
5 said global signals.